

baryon: particle + genesis: formation =
baryogenesis: formation of the particles

Can you imagine nothing? No objects, no galaxies, no dust, no cosmic rays, no vacuum energy, no space, no time: no Universe. Absolutely nothing.

Now think, can nothing have any property/ies since it is nothing? What could property/ies of nothing be? If there is any at all?

Does nothing have borders? How can you margine nothing? Therefore, it has infinite volume to begin with. Like limitless canvas to paint on. This immediately implies two instances of nothing: property (volume) and value (infinite).

What about the age of nothing? How old is it? Remember that there is no Time because the Universe hasn't formed yet. Does "No Time" mean zero (0) Time? How long will you wait until smallest amount of time pass if there is no time? You will wait for an eternity. Hence, nothing has the age (property) and value (eternal).

Already we have two properties (volume and age) and their two attributed values (infinite and eternal). I give nothing the capital letter "N": Nothing - to distinct it from the ordinary term which is used in an everyday life for the common purposes such as when saying "nothing happened" or "there is nothing in the box".

What happens next? What happens after Nothing exists for an eternity? Can anything last longer than eternity? It can't or it was not really an eternity. So, by mere logic, Nothing transforms into the initial singularity or first quantum fluctuation separating Nothing into the two opposites: zero into the plus one and minus one or, numerically, $0 = +1 -1$. Here we have very interesting relation with the Zoroastrianism (founder: Zoroaster) and Taoism (founder: Lao Tzu), occurring nearly at the same time (both respective founders lived in the 6th century BCE): while Zoroaster spoke of the cosmic duality, in the form of two opposing forces - the Good (Ahura Mazda) and Evil (Angra Mainyu), Lao Tzu revealed that Tao gave birth to the One which produced two (allegedly named Yin and Yang subsequently). Schuster is credited for the first use of the term "anti-matter" but it seems that Zoroaster and Lao Tzu were actually the first ones talking about it - not in the exact words although - some 2500 years earlier. Remarkable indeed.

Now we have two possibilities: pure logic - no special being needed or the God who rested for an eternity and decided to create the Universe. I even added two more in my philosophy: higher specie and computer simulation.

The process repeated, bit by bit, evolving accordingly with the each step in respect to the quantity and diversity. Science named that process inflation and it happened in such a short period of time, 10^{-43} second called the Planck Epoch, which was one of the crucial factors needed to stabilize the system or, in other words, to preserve a certain amount of the matter intact and a certain amount partially intact (dark matter). The rest 70% went hello and goodbye!

Why was the evolvement, or the improvement, necessary? Because we had two perfectly contrasting elements which joined together canceled each other, annihilated mutually. If you do not efficiently separate them you will soon have Nothing again.

How did the opposites pulled through without total havoc taking place?
Experimentally confirmed, anti-matter exists in the small quantities observed.
Where is all the rest?

This operations came to my mind by common sense:

diversification (quarks and anti-quarks, leptons and anti-leptons)

modification (charge, parity, spin)

coupling / decoupling

shuffling or perturbation

recombination

introduction of the physical forces (mediated through the bosons)

expansion (separation)

Diversified, modified, coupled / decoupled, shuffled (perturbated), recombined and subdued to the physical forces, or in one word: neutralised, and then separated, expanded, by the vastness of the intergalactic vacuum just to be certain contrasts are far apart. Our own anti-matter copy is fragmented and distributed between many different galaxies with millions or even billions of light years breach from the each piece respectively.

Or black holes could be the reservoirs of the anti-matter, at least that supermassive ones. Think, if the matter exists above the Higgs field isn't it logical then for the anti-matter to fall beneath? Since it has the negative mass. Why do sudden energy releases occur - along the axis of the rotation as I assume? Perhaps some matter was trapped by the black hole's gravity pull, annihilated in the middle, with the anti-matter, creating huge blast wave that had to come out.

Maybe, the anti-matter is pushed on the edge of the Cosmos, by the dark energy which is actually the remnant of the primordial cancellation, riding the border like a cowboy and that way maintaining the necessary split distance among itself and its counterpart.

Discoveries of the positron (1932.), anti-proton (1955.), anti-neutron (1956.), creating and trapping the antihydrogen atoms (positively charged positron orbiting a negatively charged antiproton) in CERN (2011.), Deep Underground Neutrino Experiment (DUNE), still unconfirmed theoretic predictions and the rest of the efforts made by different laboratories around the world encourage the theory that anti-matter is real and lurking somewhere, probably, in the cosmic depths. Or it is right here and now, in us and around us, embedded and tamed to serve us instead of destroying us.

Only other solution is that the Universe has started out of the matter solely. Then where did that matter came from? I see no third possibility: it either came from an equal amounts of the matter and anti-matter or it came from the matter solely but in that case we haven't actually explained the formation of the matter to begin with.

Each particle of the matter has a mass and a charge (either positive, negative or neutral). Antimatter particles look almost like their counterparts: they have the same mass but opposite charge.

What about the neutrino - the most abundant particle in the Universe and fundamental meaning it isn't made of the smaller pieces? Neutrinos have neutral charge. Does it mean that neutrinos don't have their antiversion? It

seems so but scientists aren't sure yet. Neutrino is a product of the radioactive decay but it also comes from many other sources like the nuclear fission and as a result of the super novae (star explosion). Neutrinos are also incredibly small and light. They have tiny mass traveling near the speed of the light. They are the lightest of all of the subatomic particles that have mass. Their mass is so small that it can not be measured with current technology. They are extremely hard to detect: most neutrinos will pass through the Earth without any interaction! Although Wolfgang Pauli first spoke about particle with properties like neutrino Enrico Fermi was the one who first officially used that term. There are three types of the neutrino: Tau, Muon and Electron. The very interesting thing is that neutrinos oscillate between three modes rather than stick to just one. Funny bunch! Always smiling and cheering people up! Not like those lurky black holes. Perhaps neutrinos pass through the black hole as well. Can we do the spectrometry of the black hole using the neutrino-based scanner?

The U.S. Department of Energy's Fermilab is the host laboratory while DUNE consists of the massive neutrino detectors, at Fermilab in Illinois and Sanford Underground Research Facility in South Dakota.

There is a hypothesized particle called axion but its characteristics (neutral charge, very low mass, weakly interacting with the ordinary matter) look very much like those of the neutrinos.

Until my theories about the baryogenesis riddle are experimentally proven, making me eligible to receive the adequate prize in the field of the particle

physics, I will patiently proceed with my scientific work.